

US007003456B2

## (12) United States Patent Gillick et al.

# (54) METHODS AND SYSTEMS OF ROUTING UTTERANCES BASED ON CONFIDENCE ESTIMATES

(75) Inventors: Laurence S. Gillick, Newton, MA

(US); Robert Roth, Newtonville, MA (US); Linda Manganaro, Arlington, MA (US); Barbara R. Peskin, Berkeley, CA (US); David C. Petty, Cambridge, MA (US); Ashwin Rao,

Redmond, WA (US)

(73) Assignee: ScanSoft, Inc.

(\*) Notice: Subject to any disclaimer, the term of this

patent is extended or adjusted under 35 U.S.C. 154(b) by 555 days.

0.5.c. 154(b) by 555 d

(21) Appl. No.: 09/878,173

(22) Filed: Jun. 12, 2001

(Under 37 CFR 1.47)

## (65) **Prior Publication Data**

US 2002/0133341 A1 Sep. 19, 2002

### Related U.S. Application Data

- (60) Provisional application No. 60/210,823, filed on Jun. 12, 2000.
- (51) Int. Cl. *G10L 15/26* (2006.01)

## (56) References Cited

### U.S. PATENT DOCUMENTS

5,414,755 A	*	5/1995	Bahler et al	704/246
5,832,430 A	*	11/1998	Lleida et al	704/251
6,067,514 A	*	5/2000	Chen	704/235

## (10) Patent No.: US 7,003,456 B2 (45) Date of Patent: Feb. 21, 2006

6,122,613	A *	9/2000	Baker	704/252
6,185,528	B1 *	2/2001	Fissore et al	704/256
6,216,123	B1 *	4/2001	Robertson et al	704/251
6,298,326	B1 *	10/2001	Feller	704/270
6,308,158	B1 *	10/2001	Kuhnen et al	704/235
6,535,850	B1 *	3/2003	Bayya	704/239

#### FOREIGN PATENT DOCUMENTS

GB	2323694 A	9/1998
WO	WO9834217	8/1998

#### OTHER PUBLICATIONS

European Patent Office, International Search Report for PCT/US01/18719, mailed Apr. 12, 2001.

Gillick L. et al., A Probalistic Approach to Confidence Estimation and Evaluation, 1997 IEEE International Conference on Acoustics, Speech and Signal Processing, Speech Processing, Munich, Apr. 21, 1997, vol. 2, pp. 879-882.

\* cited by examiner

Primary Examiner—Vijay B. Chawan (74) Attorney, Agent, or Firm—Fish & Richardson P.C.

### (57) ABSTRACT

A computer-based method of routing a message to a system includes receiving a message, and processing the message using large-vocabulary continuous speech recognition to generate a string of text corresponding to the message. The method includes generating a confidence estimate of the string of text corresponding to the message and comparing the confidence estimate to a predetermined threshold. If the confidence estimate satisfies the predetermined threshold, the string of text is forwarded to the system. If the confidence estimate does not satisfy the predetermined threshold, the information relating to the message is forwarded to a transcriptionist. The message may include one or more utterances. Each utterance in the message may be separately or jointly processed. In this way, a confidence estimate may be generated and evaluated for each utterance or for the whole message. Information relating to each utterance may be separately or jointly forwarded based on the results of the generation and evaluation.

## 35 Claims, 2 Drawing Sheets

